

Stock Market Prediction using LSTM

Homework 1 of Artificial Neural Network

Rohit Das

Student ID -61047086s

Computer Science and Engineering

National Taiwan Normal University

Taipei City, Taiwan

rdas.879@gmail.com

Abstract—This report provides a detailed information of LSTM model used in predicting the closing price of a company enlisted in stock market .

Index Terms—Artificial Neural Network, RNN, LSTM

I. INTRODUCTION

This is the report of first homework of Artificial Neural Network course in National Taiwan Normal University. The main goal of this project is predicting the closing price of LOTUS pharmaceuticals for consecutive 5 days.

II. METHODS

Recurrent Neural Networks(RNN) is an advanced for of Neural Networks that has internal memory that makes it capable of processing long sequences. This makes RNN very suitable for stock price prediction, which involves long historical data. However, RNNs suffer from the problem of vanishing gradients, which hampers learning of long data sequences. Here LSTM is introduced to tackle this problem. It is capable of handling the vanishing gradient problem faced by RNN.

III. EXPERIMENT

The LSTM model used in this experiment contains two layers and are Fully Connected(FC). The lookback value I used is 5 days closing prices(a month). 16 neurons are added as hidden dimensions with dropout value 0.5 to prevent overfitting. Activation Function used is tanh.

IV. RESULTS

The results are all created in Google Colab : The results generated from the model shows that after 2000 epochs, we can see that the loss has started to decrease to 0. The model generated Train Score: 258.69 RMSE(Root Mean Square Error) and Test Score: 277.30 RMSE. Below is the graphical visualization of the actual value and predicted value.

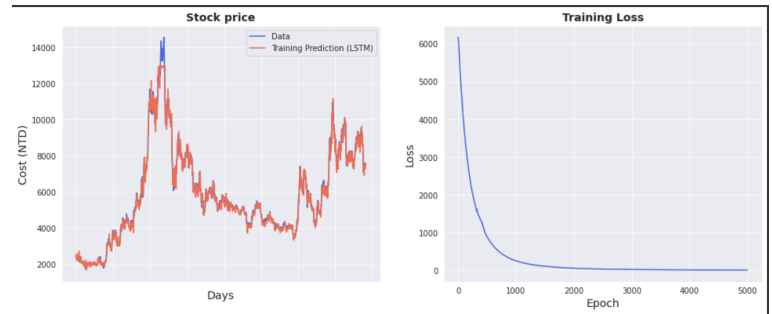


Fig. 1. Prediction and Training Loss

V. CONCLUSION

Stock market prediction with Neural Networks is interesting but very difficult with only 1 feature. Volume can also play an important role in predicting the values. Co-relating these two features can result in much better accuracy. If we can train the model on some statistics maybe we can have some better accuracy in prediction. I thank professor Yeh for giving me this opportunity to learn something fascinating and new.

VI. REFERENCES

Some website references:

- 1) A Gentle Introduction to Long Short-Term Memory Networks by the Experts
- 2) Recurrent Neural network: Wikipedia
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